FRIEDMAN SIEGELBAUM LLP, Seven Becker Farm Drive, Roseland, New Jersey 07068

A

EXPRESS MAIL number EJ851548393US Deposited October 12, 1999

I hereby certify that this paper or fee is being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231

Signature of Person Undertaking Mailing

COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

jc713 U.S. PTO
10/12/99

JG678 U.S. PTO
09/415673
10/12/99

Docket No.: 2754/MEINKE
Date: October 12, 1999

Sir:

Transmitted herewith for filing is the patent application of Hartmut ~~Hartmut~~ Schön
(Name(s) of Inventor(s))

FOR: Fluidized-Bed Reactor for the Oxychlorination of Ethylene, Oxygen and HC1
(Title of Application)

ENCLOSED ARE:

(X) **Specification** (5 pages), Claims (2 pages / 8 claims) & **Abstract**: Yes X 2 Sheets of Drawing(s);
(X) **Declaration and Power of Attorney** EXECUTED? Yes X No ____
(X) **Assignment to** Krupp Uhde GmbH
Friedrich-Uhde-Strasse 15, 44141 Dortmund, Germany
(X) Certified copy of German Application No.: 198 49 709.1
the priority of which is claimed under 35 USC 119;
( ) Verified Statement to establish **Small Entity Status** under 37 CFR 1.9 and 1.27
( ) Information Disclosure Statement, PTO-1449 and ____ references;
(X) Preliminary Amendment

THE FILING FEE HAS BEEN CALCULATED AS SHOWN BELOW:

	Claims filed *	Extra	SMALL ENTITY or LARGE ENTITY	
Basic Fee			$ 380.00	$ 760.00
Total Claims	16 - 20 =	X $9.=	X $18. =	-
Indep. Claims	2 - 3 =	X $39.=	X $78.=	-
Multiple Dep. Claim Presented?		X $130.=	X $260.=	
Total Filing Fee:			$	$ 760.00
Assignment recordal fee ($40.00):			$	$ 40.00
PLEASE CHARGE:			$	$ 800.00

***Count After Preliminary Amendment**

(X) Enclosed are checks for the fees indicated above.

The Commissioner is hereby authorized to charge payment of the following fees associated with this communication and credit and overpayment to Deposit Account No. **06-0923**. A duplicate copy of this sheet is enclosed.

( ) The fees indicated above.
(X) Any additional filing fees required under 37 CFR 1.16.
(X) Any filing fees under 37 CFR 1.16 for the presentation of extra claims.

The Commissioner is hereby authorized to charge payment of the following fees during the pendency of the application or credit any overpayment to Deposit Account No. **06-0923**. A duplicate copy of this sheet is enclosed.

(X) Any additional filing fees required under 37 CFR 1.17.
(X) Any filing fees under 37 CFR 1.16 for the presentation of extra claims.

Respectfully submitted
for Applicant,

Shahan Islam
Reg. No. 32,507

Friedman Siegelbaum LLP
Seven Becker Farm Road
Roseland, NJ 07068-1757
973/992-1990 Ext. 191

F:\USERS\ANNE\MEINKE\2754\TRANSMIT.DOC

Express Mail: Mailing Label Number EJ851548393US Date of Deposit: October 12, 1999
I hereby certify that this correspondence is being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231

Shahan Islam

2754/MEINKE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Hartmut Schön	
Serial	Not Assigned	Examiner: Not Assigned
Filed:	Herewith	Group Art Unit: Not Assigned
For:	FLUIDIZED-BED REACTOR FOR THE OXYCHLORINATION OF ETHYLENE, OXYGEN AND HCl ACCELERATOR	

Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Prior to an action on the merits, please amend the above-identified application as follows:

IN THE CLAIMS:

Please amend claims 1-8 and add claims 9-16 as follows:

1. (Amended) A fluidized-bed reactor for the oxychlorination of ethylene, oxygen and HC1, said reactor comprising:

a heat exchanger, [consisting of] including a plurality of tube packets, in the fluidized bed for releasing [the] heat evolved [owing to the] from exothermic reaction to a heat-transfer medium in the tube packets, in particular to water/steam[,]; and

a ring pipe, wherein the tube packets [coming] come into contact with water via [a] the ring pipe and the steam [being] removed via [a] the ring pipe, wherein the ring pipe is mounted as a collector or chamber [(9, 10) directly] on the reactor wall [(4)].

2. (Amended) A [process] fluidized-bed reactor as claimed in claim 1, wherein the distribution or collecting chamber [(9, 10)] is mounted internally on the reactor wall [(4)].

3. (Amended) The [process] fluidized-bed reactor as claimed in claim 1 [or 2], wherein the distribution or collecting chamber [(9a, 10a)] is mounted externally on the reactor wall.

4. (Amended) The [process] fluidized-bed reactor as claimed in [any of the preceding claims] claim 1, wherein the distribution or collecting chamber [(9b, 10b)] is mounted both internally and externally on the reactor wall.

5. (Amended) The [process] fluidized-bed reactor as claimed in [any of the preceding claims] claim 1, wherein the chamber [(9, 10)] is essentially rectangular in cross-section [(Fig. 3, Fig. 5)].

6. (Amended) The [process] fluidized-bed reactor as claimed in [any of the preceding claims] claim 1, wherein the chamber [(9a)] is essentially semicircular in cross-section [(Fig. 4, Fig. 7)].

7. (Amended) The [process] fluidized-bed reactor as claimed in [any of the preceding claims] claim 1, wherein the chamber [(9, 10)] is essentially circular in cross-section, wherein one half of the circular shape [being] is coordinated with the interior of the reactor [(4)] and the other half with the exterior of the reactor [(Fig. 6, Fig. 8)].

8. (Amended) The [process] fluidized-bed reactor as claimed [in any of the preceding] claims claim 1, further comprising, [wherein the] holes [(13)] for connecting the pipelines [(7, 8)

are] said holes being in the form of throttle holes for defining a desired pressure loss and hence for ensuring uniform flows over the various tube packets.

--9. (New) A process for the oxychlorination of ethylene, oxygen and HC1, said reactor providing the steps of:

providing a fluidized bed reactor;

providing a heat exchanger, including a plurality of tube packets, in the fluidized bed for releasing heat evolved from exothermic reaction to a heat-transfer medium in the tube packets, in particular to water/steam; and

causing the tube packets to come into contact with water via a ring pipe; steam via a ring pipe, wherein the ring pipe is mounted as a collector or chamber on the reactor wall.

10. (New) The process as claimed in claim 9, wherein the distribution or collecting chamber [(9, 10)] is mounted internally on the reactor wall.

11. (New) The process as claimed in claim 9, wherein the distribution or collecting chamber is mounted externally on the reactor wall.

12. (New) The process as claimed in claim 9, wherein the distribution or collecting chamber is mounted both internally and externally on the reactor wall.

13. (New) The process as claimed in claim 9, wherein the chamber is essentially rectangular in cross-section.

14. (New) The process as claimed in claim 9, wherein the chamber is essentially semicircular in cross-section.

15. (New) The process as claimed in claim 9, wherein the chamber is essentially circular in cross-section, wherein one half of the circular shape is coordinated with the interior of the reactor and the other half with the exterior of the reactor.

16. (New) The process as claimed in claim 9, further providing, holes for connecting the pipelines said holes being in the form of throttle holes for defining a desired pressure loss and hence for ensuring uniform flows over the various tube packets.

REMARKS

The purpose of this amendment is merely to remove some of the improper multiple dependencies in this application, to conform some of the language to U.S. practice and to remove the element reference numerals from the claims.

The amendment does not constitute a relinguishment of any subject matter; applicant reserves the right to bring back any of the same dependencies existing prior to this amendment.

Respectfully submitted
FRIEDMAN SIEGELBAUM LLP

Shahan Islam (Reg. No. 32,507)

Dated: October 12, 1999

Friedman Siegelbaum, LLP
Seven Becker Farm Road
Roseland, New Jersey 07068
(973) 992-1990, Ext. 191

F:\users\Anne\MEINKE\2754\Preliminary amend.doc

2754/MEINKE

Application for Letters Patent of the United States

Inventor:

HARTMUT SCHÖN

Title of Invention:

FLUIDIZED-BED REACTOR FOR THE OXYCHLORINATION OF ETHYLENE, OXYGEN AND HCl

To All Whom It May Concern:

The following is a specification of the aforesaid Invention.

FLUIDIZED-BED REACTOR FOR THE OXYCHLORINATION OF ETHYLENE, OXYGEN AND HCl

The present invention relates to a fluidized-bed reactor for the oxychlorination of ethylene, oxygen and HCl, comprising a heat exchanger, consisting of a plurality of tube packets, in the fluidized bed for releasing the heat evolved owing to exothermic reactions to a heat-transfer medium in the tube packets, in particular to water/steam, the tube packets coming into contact with water via a ring pipe and the steam being removed via a ring pipe.

In the oxychlorination, ethylene, oxygen and HCl are reacted in a fluidized-bed reactor (oxychlorination reactor) over a copper-containing catalyst to give 1,2-dichloroethane and water. The heat evolved in this reaction is released by the catalyst, via a tube system present in the reactor (and consisting of a plurality of tube packets) to boiler feed water for steam generation or to a heat-transfer medium. The BFW (the heat-transfer medium) is distributed over the tube system to a ring pipe present outside the reactor. The steam formed (the heated-up heat-transfer medium) is collected and removed via a ring pipe, likewise present outside the reactor.

In the known embodiment, there are, inter alia, the following disadvantages:

Depending on the number of tube packets in the internal tube system, the two external ring pipes have a large number of connecting pipes through the wall to the tube packets. In the connecting pipes for the cooling water (the heat-transfer medium), aperture plates are used in additional flange connections to achieve uniform distribution over the individual tube packets via the pressure loss. Accessibility and maintenance of the ring pipes are achieved by means of a 360° platform. Simulation of the ring pipes as a model for the pipe stress calculations is very complex and expensive. The oxychlorination reactor must be very carefully insulated to avoid falling below the dew point. Owing to the many wall connection pieces for the ring pipe connections and the platform consoles, this is very difficult and time-consuming.

It is the object of the invention to provide a solution by means of which, while avoiding the disadvantages described above, a compact but economical solution which is easy to manufacture is provided, which solution avoids the expensive drilled holes, and in particular facilitates the calculation of the ring pipes and dispenses with a large number of wall passages.

This object is achieved, according to the invention, by an apparatus of the type defined at the outset

if the ring pipe is mounted as a collector or chamber directly on the reactor wall.

By means of the invention, it is possible to replace the large number of wall passages or the aperture plates by simple holes in the internal collector, considerably simplifying the insulation of the reactor.

Further embodiments of the invention are evident from the subclaims, which relate to the particularly expedient designs of the apparatus according to the invention.

In a particular embodiment, for example, the holes for connecting the pipelines are in the form of throttle holes for defining a desired pressure loss and hence for ensuring uniform flows over the various tube packets.

Thus, the pressure distribution in the collector and the pipelines can be influenced by the corresponding precalculated choice of the diameter alone.

The invention is illustrated in more detail below, by way of example, with reference to the drawing. This shows in

Fig. 1 a schematic simplified diagram of the passage region of the pipelines according to the prior art with external ring collectors,

Fig. 2 by way of comparison a diagram of the embodiment according to the invention and

Fig. 3 to 8 different design variants of the invention as simplified sectional diagrams in the region of the reactor wall.

Fig. 1 shows a solution according to the prior art. Here, the reactor denoted in general by 1 has a large number of tube packets 2 as heat exchanger, comprising ring pipes 5 and 6, arranged on a console 3 outside the reactor wall 4, for, for example, the inflowing cooling water in the ring pipe 5 and withdrawn steam in the ring pipe 6. It is evident, however, that the feed and discharge pipes 7 and 8, respectively, must be led individually through the reactor wall, and the associated computational, design and manufacturing effort is clear.

Fig. 2 shows, represented in the same manner, a simplified section through the corresponding part of the reactor according to the invention, likewise denoted by 1.

Here, the tube bundles 2 end in two ring collectors 9 and 10 which are mounted in the interior on the wall and are, for example, rectangular or trapezoidal, the heat-exchange medium being introduced via the ring collector or distributor 9 and the steam being removed, for example, via the collector 10. For this purpose, only two transverse connecting pieces 11 and 12 pass through the reactor wall 4 in the example shown in Fig. 2. The feed pipes 7 and the return pipes 8 for the steam pass only through the inner wall of the collectors 9 and 10, respectively.

Figs. 3 to 8 show embodiments relating to the shape and mounting of the collectors 9 and 10. It is evident that throttle holes, denoted in general by 13, are provided, for example, in the passage walls and also in the reactor wall in order to establish or compensate pressure differences. These holes may vary in size depending on positioning relative to the feed connecting piece and the discharge connecting piece.

Patent claims:

1. A fluidized-bed reactor for the oxychlorination of ethylene, oxygen and HCl, comprising a heat exchanger, consisting of a plurality of tube packets, in the fluidized bed for releasing the heat evolved owing to the exothermic reaction to a heat-transfer medium in the tube packets, in particular to water/steam, the tube packets coming into contact with water via a ring pipe and the steam being removed via a ring pipe, wherein the ring pipe is mounted as a collector or chamber (9, 10) directly on the reactor wall (4).

2. A process as claimed in claim 1, wherein the distribution or collecting chamber (9, 10) is mounted internally on the reactor wall (4).

3. The process as claimed in claim 1 or 2, wherein the distribution or collecting chamber (9a, 10a) is mounted externally on the reactor wall.

4. The process as claimed in any of the preceding claims, wherein the distribution or collecting chamber (9b, 10b) is mounted both internally and externally on the reactor wall.

5. The process as claimed in any of the preceding claims, wherein the chamber (9, 10) is essentially rectangular in cross-section (Fig. 3, Fig. 5).

6. The process as claimed in any of the preceding

claims, wherein the chamber (9a) is essentially semicircular in cross-section (Fig. 4, Fig. 7).

7. The process as claimed in any of the preceding claims, wherein the chamber (9, 10) is essentially circular in cross-section, one half of the circular shape being coordinated with the interior of the reactor (4) and the other half with the exterior of the reactor (Fig. 6, Fig. 8).

8. The process as claimed in any of the preceding claims, wherein the holes (13) for connecting the pipelines (7, 8) are in the form of throttle holes for defining a desired pressure loss and hence for ensuring uniform flows over the various tube packets.

Abstract:

By means of a fluidized-bed reactor for the oxychlorination of ethylene, oxygen and HCl, comprising a heat exchanger, consisting of a plurality of tube packets, in the fluidized-bed for releasing the heat evolved owing to exothermic reaction to a heat-transfer medium in the tube packets, in particular to water/steam, the tube packets coming into contact with water via a ring pipe and the steam being removed via a ring pipe, it is intended to provide an economical solution with which the expensive drilled passages are avoided, in particular the calculation for ring pipes is facilitated and a large number of wall passages is dispensed with.

This is achieved by the ring pipe being mounted as a collector or chamber (9, 10) directly on the reactor wall (4).

Drawing to be published in this context: Fig. 2.

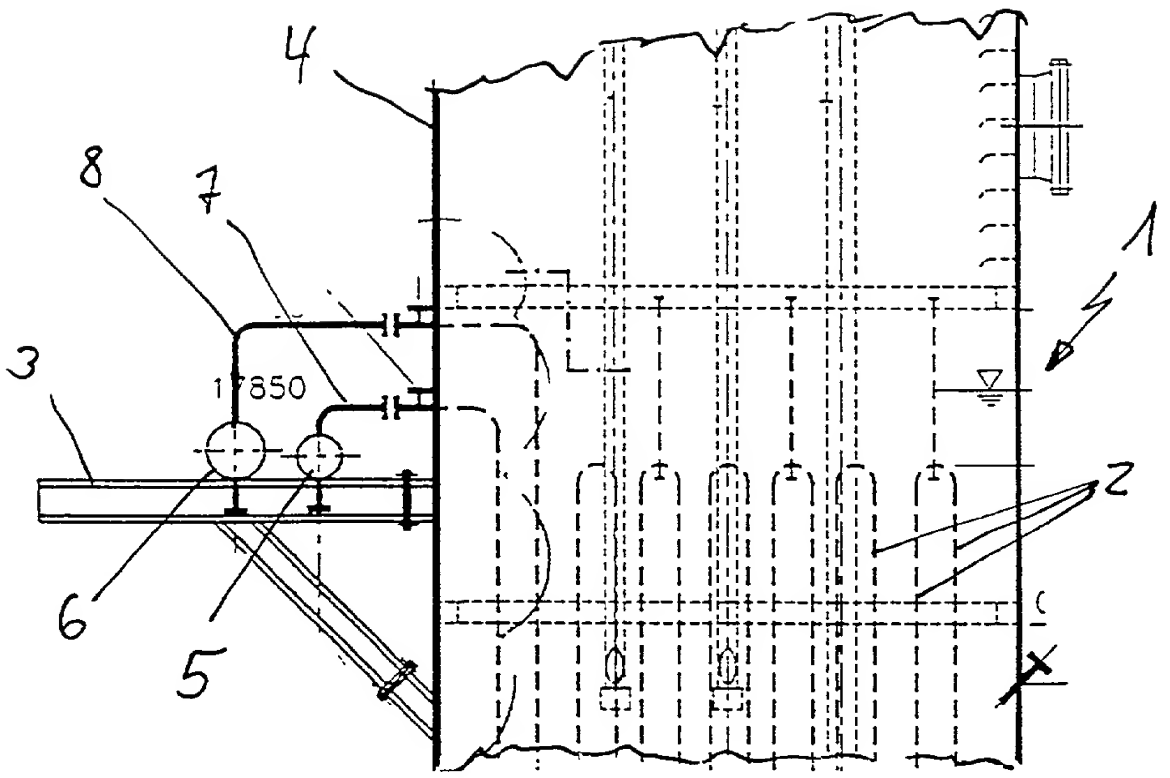

Fig.1 (St.d.T.)

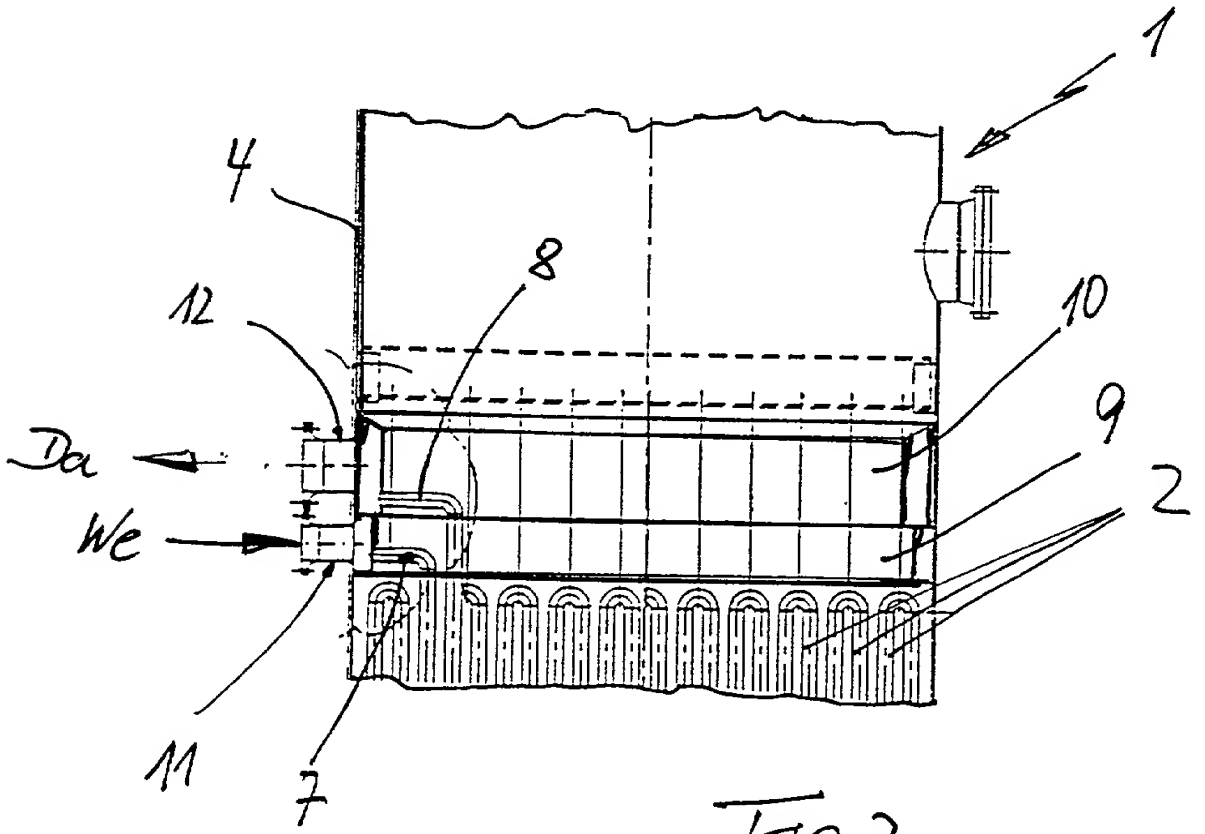

Fig.2

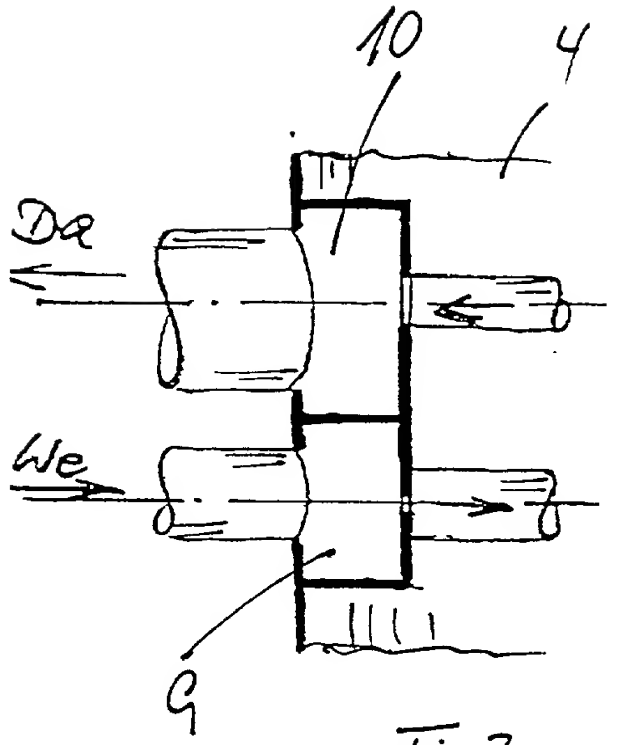

Fig. 3

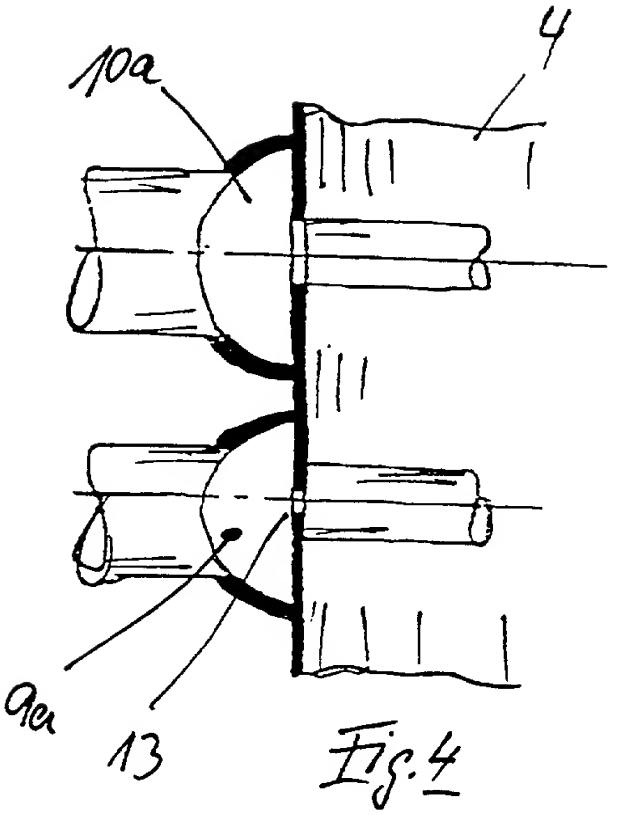

Fig. 4

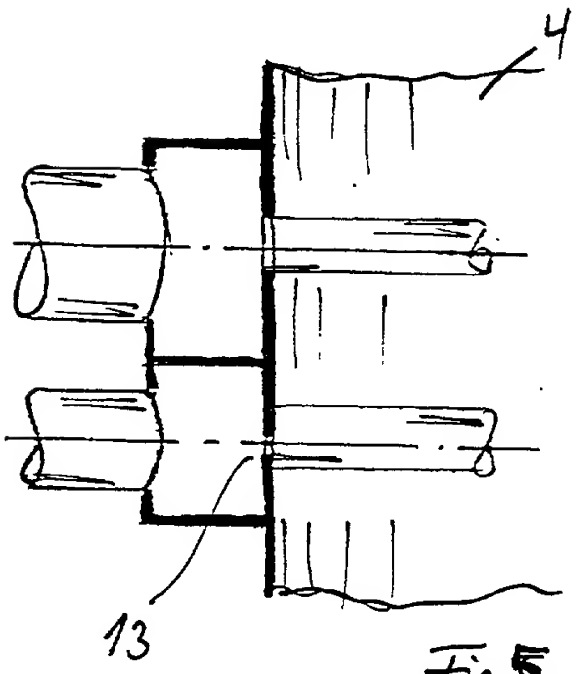

Fig. 5

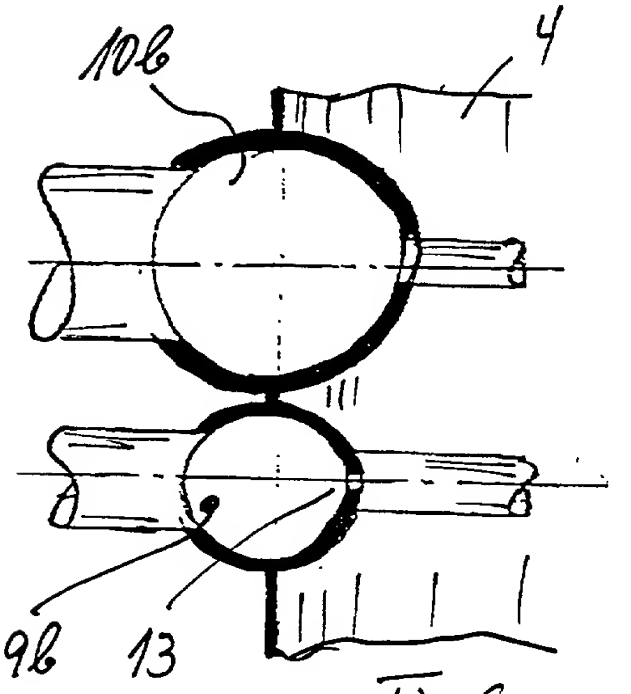

Fig. 6

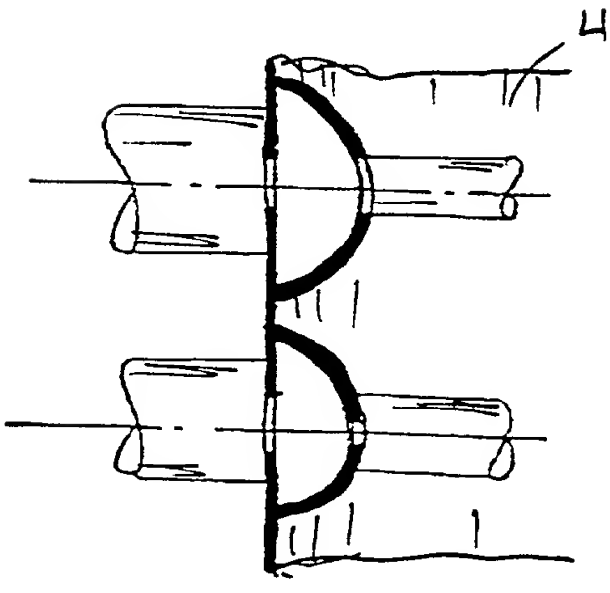

Fig. 7

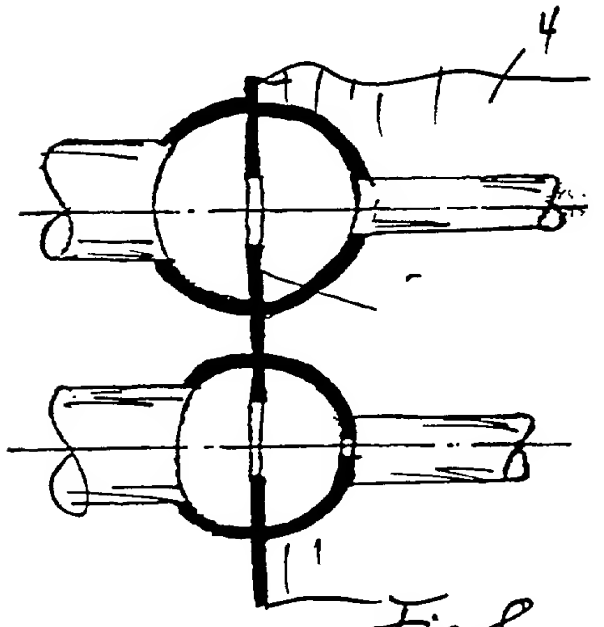

Fig. 8

Friedman Siegelbaum Docket No.: 2754/MEINKE

Declaration and Power of Attorney for Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eide Statt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Name aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as stated below next to my name.

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstande bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Wirbelschicht-Reaktor zur Oxichlorierung von Ethylen, Sauerstoff und HCl

Fluidized-Bed Reactor for the Oxychlorination of Ethylene, Oxygen and HCl

deren Beschreibung
(zutreffendes ankreuzen)

the specification of which
(check one)

☒ hier beigefügt ist.

☒ is attached hereto.

☐ am _____ unter der Anmeldungsseriennummer _____ eingereicht wurde und am _____ abgeändert wurde (falls tatsächlich abgeändert). _____

☐ was filed on _____ Application Serial No. _____ and was amended on _____ _____ (if applicable)

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchge-sehe und verstanden habe, die eventuell durch einen Zusatzantrag wi oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the content of the above identified specification, including the claims, as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldun in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

I acknowledge the duty to disclose information which is materia to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäs Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten Paragraph 119 aller unten angegebenen Auslandsanmeldunge für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkund nachstehend gekennzeichnet, die ein Anmeldedatum haben, da vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified belo any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

German Language Declaration

Prior foreign applications
Priorität beansprucht

			Priority Claimed	
198 49 709.1	Germany	28/10/98	[X]	[ ]
(Number) (Nummer)	(Country) (Land)	(Day/Month/Year Filed) (Tag/Monat/Jahr eingereicht)	Yes Ja	No Nein
			[ ]	[ ]
(Number) (Nummer)	(Country) (Land)	(Day/Month/Year Filed) (Tag/Monat/Jahr eingereicht)	Yes Ja	No Nein
			[ ]	[ ]
(Number) (Nummer)	(Country) (Land)	(Day/Month/Year Filed) (Tag/Monat/Jahr eingereicht)	Yes Ja	No Nein

ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem erste Paragraphen des Absatzes 35 der Zivilprozessordnung der Ver einigten Staaten, Paragraph 112 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) mein Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) below and, insofar as the subject matter of each of the claims of this application is no disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.) (Anmeldeseriennummer)	(Filing Date) (Anmeldedatum)	(Status) (patentiert, anhängig, aufgegeben)	(Status) (patented, pending, abandoned)
(Application Serial No.) (Anmeldeseriennummer)	(Filing Date) (Anmeldedatum)	(Status) (patentiert, anhängig, aufgegeben)	(Status) (patented, pending, abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen un Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragrap 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängni bestraft werden koennen, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährde können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on informatio and belief are believed to be true; and further that these statements were made with the knowledge that willful false statemen and the like so made are punishable by fine or imprisonment, o both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validit of the application or any patent issued thereon.

German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage rmit den nachstehend benannten Patentanwalt (ode die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldun sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent-und Warenzeichenamt:

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

Stanley I. Rosen, Reg. No. 19,441
Richard I. Samuel, Reg. No. 24,435
Shahan Islam, Reg. No. 32,507
Theresa A. O'Rourke, Reg. No. 40,747

Telefongespräche bitte richten an:
Shahan Islam

Direct Telephone Calls to:
(973) 992-1990, Ext. 191

Postanschrift:

Send Correspondence to:
FRIEDMAN SIEGELBAUM
Seven Becker Farm Road
Roseland, New Jersey 07068-1757

Hartmut Schön 24.9.99

Unterschrift des Erfinders **Datum**

Inventor's Signature **Date**

Voller Name des einzigen oder ursprünglichen Erfinders:

Hartmut Schön

Full name of first or sole inventor

Wohnsitz

~~Altenhöferweg 13~~ Brüder-Grimm-Str. 2a 24.9.99 HS
61440 Oberusel
Germany

Residence

Staatsangehörigkeit

German

Citizenship

Postanschrift

Post Office Address

Unterschrift des Erfinders **Datum**

Hartmut Schön 24.9.99

Harmut Schön

Inventor's Signature **Date**